LAKE VICTORIA FISHERIES RESEARCH PROJECT PHASE II

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Notes for guidance on preparation of research reports, research dissertations and scientific papers

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Notes for guidance on preparation of research reports, research dissertations and scientific papers

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1. INTRODUCTION TO SCIENTIFIC RESEARCH

Fisheries has developed as a branch of marine biology over the past 100 years, and is thus a relatively young discipline in comparison to say medicine. A general aim of fisheries science is to develop a basis for the development of sound resource utilization and management through independent research, collection and synthesis of relevant information from basic aquatic and social sciences, and thorough understanding of how modern resource exploitation functions. The underlying principles and requirements of the research are the same in fisheries science as in other fields of science.

Then, what are the characteristics and requirements of a scientific investigation?

Ideally it can be defined as:

> "*The testing of a hypothesis by means of the best available method with the aim of providing new or better understanding and knowledge on the subject.*"

Making a short detour into scientific philosophy, one could furthermore ask: What exactly is better understanding and knowledge? Presuming that we are trying to study the puzzles and problems of nature within the frame of a common set of scientific paradigms (Kuhn 1970)[1], our investigations belong to the so-called "normal science", and the leading principles are:

a) the problem has a solution;
b) there are given rules for the procedures;
c) there are given rules for what is a solution.

The implication of this is that science is not just random objective gathering, accumulation and classification of any odd facts, but it is more a selective collection of relevant facts, aiming to support or reject the 'ruling' theories. Gould (1977) wrote: '*The results of a scientific work evolve from a complicated interaction between hypothesis-testing, intuition, fantasy and influence from social/political factors.*'

Scientific research is traditionally divided into what are called "basic research" and "applied research":

Term:	Objectives and characteristics
Basis research:	To offer descriptions and analyses of basic phenomena and processes with the aim of increasing knowledge of natural structures and their functions.
Applied research:	To offer solutions to specific problems for which there is an immediate demand, i.e. preconceived objectives: monitoring, mapping, consequence analyses, product development.

[1] A scientific paradigm decides which are to be facts, how these are interpreted and which conclusions it is "legal" to draw. So a paradigm consist of the rules of scientific work and is shared by all scientists within a field or at least within a school.

The same distinction applies when considering the fields of aquatic biology and resource dynamics

* Basic investigations:

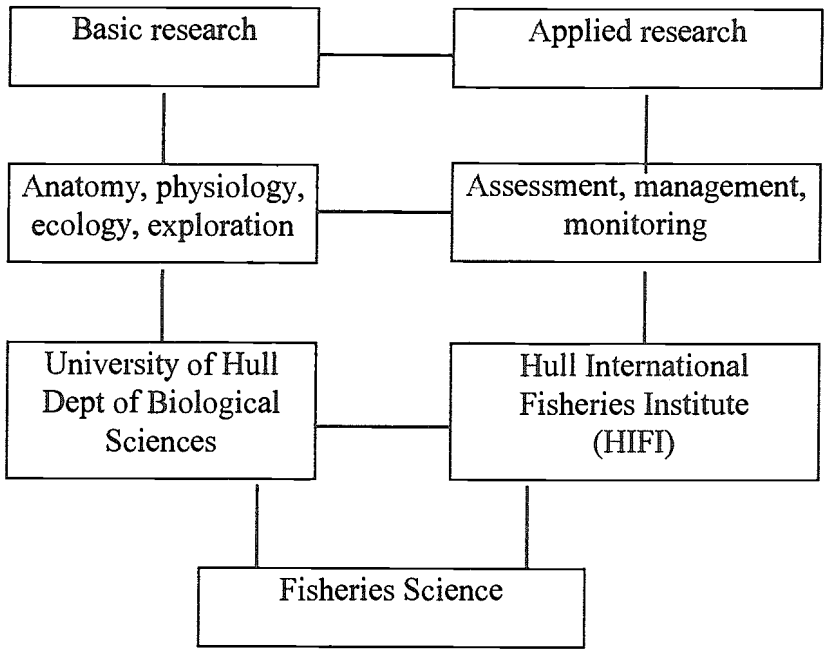
- collection of basic data on biology and ecology of aquatic organisms;
- environmental influences on natural systems and populations;
- new approaches and new resources.

* Applied investigations:

- assessment, monitoring;
- changes of vital parameters in relation to exploitation: recruitment, growth, age structure of populations, age at maturity;
- abundance estimation - Catch per unit of effort data,
  tagging and recapture experiments,
  acoustic surveys,
  egg/larvae surveys,
  fishing surveys,
  virtual population analysis (VPA from catch statistics).

More often we find diffuse transitions between these categories and it is frequently a paradox that basic research may turn out to be more applicable than the applied. Fisheries science is a typical example of a field in which it is difficult to separate 'basic' and 'applied' research by definition or for that matter by the activities of different institutions.

An example is provided by the closely associated institutions in The University of Hull which supplement each others activities:



Normally a scientific investigation follows a structured path. The following is typical, but may well be adjusted to suit specific needs:

1) definition and formulation of the hypothesis/problem;
2) literature research and pilot studies;
3) choice of strategy/methodology;
4) collection of data;
5) processing of data and interpretation of results;
6) presentation of the findings and conclusions.

ad 1) What are the objectives - ambitions - requirements?
Sub-hypothesis, Null hypothesis, alternative hypothesis. Are the desired objectives of the investigation achievable under the given circumstances? What are the limitations? - money, time, labour, method, equipment etc.

ad 2) Obtain an overview/understanding of the topic.
Avoid mistakes and unnecessary repetitions - create contact with other researchers.
Pilot studies are made to: - test the methodology; - acquire an idea of the variation in data.
This is important for further planning of the full-scale investigation and for the choice of statistical methods for analyzing the results.

ad 3) This must be based on 1) and 2). You must be prepared to make compromises between "the best possible method" and practical/economical limitations.

ad 4) Data collection requires detailed planning. You can rarely repeat a costly survey because you forgot to observe or a record certain phenomenon after the event. Make a priority list of desired information, but collect as much information as possible in the field, even if you do not recognize the immediate use of everything. Remember the cost of repeating the study will be far greater than collecting one other parameter whilst in the field or laboratory. If in doubt collect the data. Think of the data processing when you prepare the collection and make standardized sheets for recording. Design the data collection to fit the chosen statistical analysis and not the other way round, i.e. design your study prior to implementation - don't just go out and collect data and expect them to fit statistical needs later.

ad 5) Depending on the chosen methodology. Evaluate different statistical approaches (applicability and limitations). Computerized techniques are of course much more powerful in terms of handling large amounts of data, but the interpretation of the results is not done by the machine. Compare your findings with previous studies and determine to what extent they are similar or different.

ad 6) Is the work suited for presentation? The answer must always be YES if the study was well designed, even if the results are negative. Are the objectives fulfilled? Are your conclusions valid? Who are you aiming the study at? How, what, when and where are questions you should consider before you decide to submit a paper. Severe self-criticism at this stage is less painful than criticism by others later. Remember dissemination of information is an integral part of research and too many people do not "publish/report" their results. The publication or reporting of negative results and

the problems encountered is valuable because it can prevent other workers falling into the same trap or duplicating the work.

The ultimate aim is to present the work to the right audience at the right time.

Scientific research demands professional skill. In addition some portion of the following may prove beneficial:

- effort and patience;
- honesty and self-criticism;
- concentration and precision;
- open-mindedness and ability to listen to advice;
- self-control and self-irony;
- courage to present results.

A thorough knowledge and practical experience with the methods used in the particular field of research of interest is certainly necessary, but not essential. Part of the research process is a learning experience. You must be prepared to find out and test new methods, adapt to changing conditions and technology, be flexible in your thought process and not be too insular in the area of research you operate under. For example, many of the business growth prediction models used in economics are based on population growth models from natural sciences.

2. PREPARATION OF A SCIENTIFIC REPORT/PAPER/THESIS

2.1 Introduction

Recall the 6 general steps of a scientific investigation introduced in Chapter 1. The last step was presentation of the results, the important procedure to make your findings accessible to others.

There are several ways to present the results of an investigation.

* *A paper/article:* Designed for presentation in a scientific journal. Usually short and formal, i.e. certain rules and requirements must be fulfilled.

* *A thesis:* Like an article, but usually longer and more comprehensive. The main aim is here more a documentation of your ability to conduct and evaluate an investigation, than to present original discoveries.

* *A report:* Less formal, aimed at your organisation, employer, councils or institutions. Important for internal communication, development and future work.

* *A monograph/review:* A comprehensive coverage of a specific topic based mainly on literature research. A summary of defined objectives and results which should provide an evaluation of previous studies and present status of knowledge leading to recommendations for future work.

* *Presentation at a meeting:* Most researchers attend conferences and workshops to listen to talks by other researchers and present the findings of their own work. This is an excellent mode of dissemination as it allows interaction with a captive audience.

Each of these modes of dissemination has different requirements and structures that will be described in the following sections. They also have many common elements, such as use and presentation of tables and figures, referencing, nomenclature and units, which will be described later.

However, there is a recognised strategy for writing scientific and technical documents, irrespective of the contents, which will assist all, in what many find a difficult task, i.e. writing a report or research paper. This comprises five simple rules that have helped many inexperienced writers to get started, and have also helped more experienced writers to get out of a hopeless tangle of observations and inferences.

Rule 1: Write the conclusions to your paper. Even a large paper or a thesis chapter will not have more than five or six substantial conclusions. Each conclusion must be succinct, and occupy one sentence and less than two lines. The conclusions as written here will not enter into the final work so they do not need modifiers such as "however" and "that is".

Rule 2: Write only the results necessary to make the conclusions you presented.

Rule 3: Write only the methods necessary to understand how these results were obtained.

Rule 4: Write the discussion, which should present only additional information (e.g. literature) that modifies, extends, confirms, or contradicts the conclusions based on your results.

Rule 5: Write the introduction, which will have only the minimum information necessary to present the questions or hypothesis to which the conclusions are the answers.

2.2 Preparation of a scientific paper for publication in a journal

2.2.1 *General requirements*

The general requirements of a scientific paper submitted for publication in a journal, are (O'Connor & Woodford, 1979):

> A scientific article should describe significant experimental, theoretical or observational extensions of knowledge or advances in the practical application of known principles.

What then are significant extensions of knowledge? Does your work contain anything worth publishing?

To evaluate this the general advice is as follows.

BEGIN AT THE END! Write down your conclusions as clearly and precisely as possible.

- Relate them to the hypothesis or questions you are examining.
- Ask yourself: how firmly based are the conclusions?
- Evaluate them against previous knowledge.
- Discuss them with experienced scientists.

2.2.2 *Where and how to present your information*

Each of the many different journals have their own special fields of interest, habits and requirements. The best guide for an author is to read the latest set of Instructions to the authors (see Appendix 2 for examples) issued by the journals. Before choosing one you should ask yourself to whom you are addressing your findings.

- Is it of general wide interest?
- Is it of interest to most people in your field?
- Or is it of interest to only a few specialists?

This will help you to determine the right publication and style. Do not attempt to submit a paper to a journal if it is local interest or not relevant to the aims and objectives of that journal. (See Appendix 1 for an example of aims and objectives of *Fisheries Management and Ecology,* an international journal which has a specific target audience.) The editor will quickly assess the relevance and return the manuscript if he does not feel it is appropriate. This can be distressing and off putting for the authors, but with a little research about the journal could save disappointment.

2.2.3 *Organizing the paper*

A paper is conventionally separated into several main divisions.

1. Title, author(s), affiliation and running title.
2. Abstract (summary) and keywords.
3. Introduction.
4. Materials and methods.
5. Results.
6. Discussion.
7. Conclusions.
8. Acknowledgements.
9. References.
10. Eventual appendices.

Title

Short and precise, self-explanatory, should give the subject not the result, e.g. "The effects of sour people on the environment" is better than "Sour people have effects on the environment". However, let the first word be a key word if possible. Try to avoid "The" and remove other waste words such as "a study on", e.g. Effects of sour people on the environment".

Author(s)

There is no convention on which order you should list the contributors, but the main alternatives are:

- alphabetically;
- who contributed the most;
- advisor or head of laboratory takes the last position (especially in US).

Affiliation

Give the name and address of your institution. e.g.

University of Hull,
International Fisheries Institute,
Hull HU6 7RX,
UK

If the addresses of your co-workers are different from yours give brief addresses for each. Full addresses are not necessary.

Many journals also request that you provide telephone numbers, fax numbers and, most importantly, your email address. This latter requirement is now important and is published in most premier journals. It is also very useful for the editor to acknowledge receipt of your manuscript

Running header

Many journals require a brief running title to go at the top of the left hand page. This is the running header and is usually indicative of the paper content but no more than 40 characters, e.g. for the previous title "Sour people and the environment".

Abstract

With the wealth of literature, many researchers do not have time to read everything, and may only read the title and abstract. Consequently, the abstract is a very important part of the paper, which will encourage the reader to delve deeper into the content. The abstract should summarise your methods, findings and conclusions and must not include new data or interpretation. For clarity, it is often best to use numbered paragraphs, although this may not be acceptable to the journal (check the style of the journal you are targeting). Irrespective, the first statement should describe briefly what you did; followed by the main results. List of values may be indigestible so use words. State your conclusions in the last paragraph. If you have no succinct conclusion, you might write "The effect of A on B is discussed".

Keywords

All journals require a number of keywords for indexing purposes. These should indicate the subject matter of the paper. They should not just abstract words out of the title. Put them in alphabetical order.

Introduction

The introduction should be brief and concise, and should provide:

- subject, aim or scope – the objective should be clearly stated;
- background/purpose

- short review to literature relating your work to previous studies in the field (quoting numerous papers is no longer accepted);
- hypothesis;
- strategy (short).

It should not include:

- general non-significant statements;
- justifications.

Some authors repeat much of the Abstract in the Introduction This is not acceptable practice. Finally, a piece of friendly advice: tear up the first two pages.

Materials and methods

These should always be sufficiently detailed so that an independent reader can reproduce the experiment or evaluate the methods.

Eventually give the results if you have tested the method by a pilot experiment.

In the case of alternative methods, justify your choice of method.

Avoid: Description of standard methods, refer instead to a previously published descriptions, unless they are so well known that even this seems naive (depending on your audience); but always describe in details if you have modified a given standard method.

Use systematic names for chemicals and organisms when you first introduce them, after you may use trivial names when no risk of confusion can arise.

Describe if you use new or unusual equipment; give details of the manufacturer is the equipment is unusual.

This section can include a description of the study site, although for major ecological studies this could form a separate section. In either case only include essential site details which help support the findings of the paper. A good map can often summarise this information.

Results

This section should be comprehensible and coherent on its own. There should be a logical succession in relation to the hypothesis or problem.

Allow yourself to draw connections but do not start an extensive discussion, unless, in the case of small investigations, you decide to combine the result and discussion. This, however, is not acceptable to most journals so the advice is to avoid this format if at all possible..

Report negative results, do not be selective.

Use tables and figures and draw the attention to the key points of the observations. Do not write "The results of experiment A is given in Table 1", instead say "The main compenents of

the diet were X and Y (Table 1)". But do not describe tables and figures as though they were invisible.

In quantitative works the results are usually presented as processed values, i.e. values that have been derived from the original measurements by any reduction of the data. Therefore always, if possible, give estimates of precision (variation) and evaluate the accuracy, e.g. 12.56 ± 0.22 ($n = 12$). Describe statistical operations, justification and limitations. Note probability P is capital and italised, and not small p.

Some times the raw or partly processed data are referred to in an appendix or separate volume.

Discussion

A discussion is "a disquisition in which a subject is treated from different sides" (Oxford English Dictionary). It should not be too long to deter the reader, yet it must contain logical argument.

Assess the validity of your results. When writing a thesis it is here that you show your ability of sound judgement and evaluation. Do not simply repeat, in a different order, what you have already said when presenting your results.

Do not try to conceal negative results or discrepancies between your work and others related.

You may criticise, on a constructively scientific basis, the works of others, but never be personal. Make sure you are absolutely accurate when quoting others.

You should evaluate in your discussion:

- methods, errors, biases, limitations;
- the data - are they suited to what you are trying to explain?
- validity, is your production of evidence sufficient?
- reasons for accordance/discrepancies with previous works;
- implications for continued studies.

Based on this you can suggest your conclusions. Do not be over-optimistic in your claims about the precision of your work, the generality of your conclusions or the applicability of the results.

Conclusions

Occasionally it may be possible to state your conclusions as a separate section although with the pressure on page space this is becoming less acceptable. If you do make conclusions do not repeat what is said in the results and discussion, instead reword to explain the output in a different way, particularly if you want to output to be taken up by society..

Acknowledgements

Be moderate and brief. Mention only those who deserve it, e.g. grant awarding bodies, technical assistance and others with any extensive influence on the work.

References

Collect details of references on cards or any other suitable way concomitantly while you write the first draft. When this is finished make sure that you have full details of all references. Full details of an article include:

- full title of article;
- names and initials of all authors;
- year of publication;
- title of journal;
- volume number and first and last page numbers of the paper.

For references to books or chapters of books:

- title of book;
- names and initials of authors;
- names and initials of editors;
- number of edition (if it is second or later);
- first and last page numbers for chapters, total number of pages for the whole book;
- year of publication, city/town of publication and name of publisher.

List the references alphabetically after the first author's surname. There are many systems for use of stops, underlining, abbreviation etc., so be careful to follow the format of the journal. Check a recent edition of the journal for format or ask the editor for details. Please be accurate as this can be an irritation to the editing process and delay publication.

It is recommended (and some journals require) that reference to unpublished work is done in the text only.

Reports without authors are referred as Anon. (a short form of anonymous) and year.

Examples of how to list different kinds of references are given in Section 2.4.10.

Citations/quotations

There are numerous ways of citing other work in the text. These are described in section 2.4.10. It is essential to follow the correct style for single author and multiple author citations; check a recent copy of the journal for format.

Copyright

Look for copyright on the inside cover of books and publications. If you want to make public use of other people's work then always apply and obtain written permission. Also you will probably have to sign a declaration form passing copyright of your proposed paper on to the publisher, if it is accepted for publication.

Tables and figures

Make extensive use of tables and figures as these often give better access to information than text. Design and examine them in the light of the argument and structure of the paper. Be critical not to include less relevant or superfluous aspects. Generally, tables and figures should be:

- self-explaining, easy to interpret and understand;
- contain little data, only 'key-data';
- be consistent in their configuration.

Each table and figure MUST be printed on separate pages for submission. The tables should have the title at the top but for figures the title should not be added. Instead they should be listed on a separate page and the figure number plus authors should be written in soft pencil on the reverse of the figure page.

Tables should contain no vertical lines, only horizontal, see example in Section 2.4.1.

Figures must be format in such a way that they can be reduced in size by at least 50%. See Section 2.4.1 for details.

Formatting the text to the journal style.

This cannot be emphasised enough. Each journal has its own style – FOLLOW IT. One of the commonest comments from the editors is to reformat the text in the journal style, including section headings, referencing and layout. Look at a recent copy of the journal and ask for the notes for authors (which are commonly found on the inside back page of the journal). Two examples from *Fisheries Management and Ecology* and *Journal of Fish Biology* are given in Appendix 2.

Always submit the text and tables in double spacing and 12 font typeface. Do not reduce ethe document font to try to fit into a page limit set by the journal. If the paper is good enough the editor will be lenient and allow extra space.

2.2.4 *Submission of the manuscript*

Once completed the manuscript should be read by your colleagues and peers. They should be constructively critical and you should evaluate their comments and incorporate them where appropriate. If they are destructive do not ask them again. Remember this is a constructive process and if asked to review a manuscript of a colleague, be constructive yourself. It will lead to good working relationships and be a learning process in its own right.

The paper should then be put down for a few weeks if possible. Come back and read it again. You may be amazed at what you wrote. If it is unclear or ambiguous in any way amend the text.

Submit the manuscript, with the correct number of copies, to the editor, with a covering letter saying it has not been published elsewhere and how it is relevant to the journal. The editor should acknowledge receipt of the manuscript and indicate the paper is being sent for review. This many take several months, so be patient. An example of the questions asked on the referees form is given in Appendix 3 to give you an idea on the process and what you should make sure your paper addresses. You should also get detailed comments about the content and scientific merit of the paper.

2.2.5 *Review of manuscript*

Once the paper has been reviewed you will receive a letter from the editor indicating the decision made over publication. This letter usually conveys more than a simple acceptance or rejection.

Acceptance: It is rare that a paper is accepted in its original form and usually needs some form of modification. If this is the case address all the issues that are raised by the editor and the referees. I have seen papers that were accepted subject to modification returned to the editor with just a few typos corrected and none of the serious issues addressed. These are usually rejected because the author has not attempted to resolve the questions raised. If you feel that a particular issue is harsh or out of context for your paper write a covering letter to the editor explaining this: do not expect him/her to be an expert in all aspects of fisheries.

Rejection or not acceptable for publication: By no means should you feel disconsolate if your paper is rejected. You are in good company: top flight international journals have rejection rates in excess of 50%. When you receive the "not acceptable for publication" letter read it carefully. A paper is rarely rejected outright. It will often have a let out clause such as "The paper needs major revision before it will be acceptable for publication". The referee's and editor's comments should provide guidance on how this may be achieved. Follow this advice, rewrite the paper according to the comments made, and resubmit it to the journal or another more appropriate journal. As with minor modification, if you feel a comment is not valid present a justification to the editor. Occasionally it is possible the reviewers and editor can have seriously misread the paper and you believe the criticisms are totally erroneous. In this case you have two choices. Write to editor justifying your concern and ask for the paper to be re-evaluated. Be courteous; aggressive letters will result in the manuscript being returned without being reconsidered. Only do this if you are entirely sure you are right. The second choice is to submit the paper to another journal, hoping it will be judged more fairly.

2.2.6 *The proofing process*

Once the paper has been accepted it will be sent to the publishers for printing. The manuscripts are usually submitted on disk so the errors of transcription are much reduced compared to years gone by when the paper was typeset by hand. The draft printed copy is known as a galley proof. You will receive a copy prior to publication and be expected to proof read it within three days. Follow the instructions, otherwise you could delay publication.

Proofing the printed manuscript is an important part of the publication process so don't treat it lightly. Read the manuscript carefully and check for:

- misspelling of words;
- the text conveys the correct message (the editor may have made some adjustments to the submitted manuscript and changed the context);
- the figures and tables are in the correct place (i.e. as soon as possible after the place they are first mentioned in the text);
- the data presented in the tables are correct;
- the headings and captions for the tables and figures are correct;
- that all the references are complete – the editor may have asked for additional information on page numbers or place of publication; supply it.

When correcting the proof there is an established convention of marks to be used. An example of these is provided in Appendix 4. Mark the corrections on manuscript in the colour of ink requested. Note, it is expensive to make corrections at this stage and the authors are asked to keep these to a minimum. If you make too many changes you may be charged.

Resubmit the manuscript with any additional information requested, such as ordering extra copies of the paper, and wait for the paper to appear in print.

2.3 Technical report writing

2.3.1 *Introduction*

A technical report conveys certain specific information to a specific reader or readers. In the formulation of a report the writer must always bear in mind who the reader(s) will be and adjust his approach accordingly. A report serves as evidence of work that has been done; it is an essential record of work. A report is a valuable repository of information, particularly so in the scientific context. Reports also provide a challenge to the individual to be explicit and articulate. This is the crucial test of a person's knowledge, whether he can display his knowledge and at the same time make it intelligible to others. The scientific worker often tends to separate his practical work of observation and computation from writing the account of it. Ideally, the activities should be considered together.

These notes are set out to provide some guidelines for the presentations and layout of project reports and thesis. The notes are not intended to be comprehensive because they must take account of the variation in reporting procedures adopted by different subject areas and they also allow for some expression of individualism.

2.3.2 *Project proposal*

Before any work is undertaken the researcher should discuss the project proposal with a suitable advisor. These discussions should form the basis of a project proposal which is submitted to the project committee. The proposal should provide a brief introduction to the project, justifying the reasons for doing the work and how it fits into wider issues in the subject or development area, outline the basic aims and objectives of the project, the potential sources of data and information, and the mechanisms for collecting the data. If any equipment or consumables are needed for the project these should be identified at this stage and a costing prepared. A basic plan of how you anticipate completing the project and submit

the report would also be useful. The proposal should be typed and no longer than 2 pages of A4 paper.

2.3.3 *Preparing the first draft of the report*

Within the project proposal a specific time should be allocated to implementing the research work and collecting the data or other appropriate information. At this stage consideration should be given to the format of the report. The main stages in preparing the first draft of the report are:

a) collection of material;
b) selection of material;
c) logical ordering;
d) analysis/discussion.

At each of the above stages you should think of the main elements, namely, the writer, the reader and the material.

Collection of material

There is no standard way of collecting material, however, all projects benefit from a literature search to examine the current base of information relevant to your project. Use library facilities where possible to search for relevant literature in:

i) books;
ii) scientific journals;
iii) Incidental publications ;
iv) data base information available on CD Rom,
- ❑ via computerized searches in the library on INTERNET,
- ❑ via abstract publications, e.g. ASFA or Current Contents.

The literature survey acts as a starting place for the study; further information specific to your aims and objectives, may be derived as follows:

i) experimental work carried out in the laboratory or in the field;
ii) results of questionnaire surveys;
iii) correspondence with institutions, establishments or companies;
iv) reinterpretation of existing data;
v) analysis of existing data archives, including data provided by your employers.

Try to collect only information that is relevant.

Selection of material

There is no upper limit of words to work to but try to keep the report to a manageable size, about 25 000 words (approximately 80 pages of typescript). Thus it will be essential to be selective with the material that is collected. It is pointless to pad out the report with irrelevant information, you will be judged on your critical approach to the project report. Once you have a clear idea of the extent of your data base discuss the proposed structure with an

advisor or colleague. They may be able to help you make a decision on what material to include or leave out if you have problems. Reducing data and information into a useful format is perhaps one of the most difficult tasks you will have to carry out. Remember only to use information that is relevant to your argument and help you meet the aims and objectives of the project.

Logical ordering

Your method of investigation should be chronological. Even if you have divided up your work into sections you must start on one section, then go on to work on the others. However, the order of material in the report should be logical. The material can be presented in various forms and the rejection or selection of material and logical ordering must be related to the reader. A reader should be able to pick up a report and be able to say very quickly what the report is about.

Analysis/Discussion

It is essential to critically evaluate the material that you have selected and ordered. One of the enduring criticisms made by the external readers in relation to project reports is the lack of critical evaluation. Often considerable material is collected but comparatively little discussion and analysis of this information takes place.

2.3.4 *Report structure*

Outline structure

The most successful structure for technical reports (Cooper, 1964) is as follows:-

- Title page
- Contents
- Summary
- Acknowledgements
- Introduction
- Main text
- Conclusions
- Recommendations
- References/Bibliography
- Appendices

The structure may appear to lack a break down of the methods, results, analysis and discussion but these are included under the heading Main Text. This structure offers a flexible approach to the production of the report, which is required for the diversity of subject material and approach found among scientific subjects. Further comments on each of these report sections are provided below.

Title Page

The title page of the report should be set out to include the following:

- overall project affiliation;
- the title of the project;
- the name of the author(s) in FULL;
- the affiliation of the author(s);
- date of the report.

An example of title page can be seen on the front of this document.

Contents

This comprises a list of contents with corresponding page numbers including those of all your preliminary pages and those following the main text, as well as the section numbers and headings of the text itself. An example is provided at the front of this document.

If the author thinks it appropriate, the contents pages can be followed by:

i) list of tables;
ii) list of figures;
iii) list of plates.

These lists should also provide the corresponding page number and be formatted in a similar manner to the list of contents. Refer to Section 2.4.1 for suggestions on how to sequentially number tables etc.

Summary (Abstract)

The summary should be a survey of the ground covered in the report, brief but sufficient to indicate the area and depth of the study, give an overall perspective of the findings and conclusions and whether the objectives were achieved. It should not describe methods (unless they have a direct bearing on the results) or excessive speculations on the results and any other matters. It should not be regarded as part of the report but written after the report is complete. Although brief and factual, the summary should be well written, not in shorthand. It is the reader's introduction to the report and you will want it to be favourable. The order of the presentation in the summary ought to correspond with the actual report. Summaries should contain no material not mentioned in the report itself. Summaries too often contain after thought of statements to tidy things up, for which there is no evidence in the report proper.

Acknowledgements

You should acknowledge the support of all those who have provided assistance to you during the project, sources of data provided by external organisations or sources, and your funding agency, if appropriate.

Introduction

The introduction is intended to familiarise the reader with the project as a whole. The best introduction is to state in your first sentence what the report is about. You should then provide the necessary background information on the subject area to support your

introductory statement and why the subject of the project was chosen. In doing this you should establish what the aim of your line of enquiry is and how it fits into the overall subject matter.

If, for example, you choose a topic related to the marketing of a particular company's product, then the aim might well be to assess the efficiency of the company's marketing strategy in the light of selected criteria. The aim should be made clear to the reader at the outset and, where possible, indicated in the title of your report; for example, "Marketing Strategy for XYZ Ltd 1981 - 1989".

It is important that the Introduction should only give the **minimum** of historical data needed to set the scene for the author's own investigations. Only other workers results essential to the arguments should be presented. Much data can be taken for granted or quoted in an abbreviated form.

You should also inform the reader how you propose to develop the subject under discussion and to provide an outline, perhaps as a series of objectives. These are, in effect, statements representing the boundaries of framework within which the subject is written. Objectives are the means by which the aim(s) is (are) achieved. For example, in considering the aim of assessing the efficiency of a company's marketing strategy, typical objectives might be to:

a) examine the pattern of transportation;
b) investigate worker/management relationships.

Such objectives may be obtained from a range of literature written on the subject beside those you feel are important.

Main text

The structure of the main text will vary depending on the subject material. The classification of your material in the early stages of preparing the report will have some bearing on the main text. The issues outlined in the introduction will be gone into in depth. However, it must be divided into appropriate sections and, if necessary, sub-section in order to present the information is an easily assimilated form. The system of formatting between headings and sub-headings must be consistent.

For a scientific report based on experimental work the main text may be arranged along the following lines:

- literature review;
- study area;
- materials and methods;
- results;
- discussion.

It is possible that if two or more experiments are conducted to make up the study you could have a series of chapters which are sub-divided into these sections. NB all sub-sections may not be necessary, it depends on the project.

Literature Review

This should provide an overview of the appropriate literature and is only used to set the scene. In many cases this may not be necessary and the literature can be incorporated into the discussion.

Study Area

In most studies it is beneficial to provide a brief description of the study area for the reader. This often allows the reader to put the study into a better geographical or habitat perspective and the writer an opportunity to indicate the main features of the system under study.

Results

The results should contain a clear concise and logical presentation of the experimental findings. They should be laid out in brief form using where possible tables, figures, illustrations, photographs, etc. Lengthy data sequences, if relevant, should be confined to the Appendices. Essentially concise reporting of the results of the project undertaken is required. It is important to bear in mind any sections dealing with results should adhere to presenting new information and should not stray into the discussion. Analysis and discussion should be dealt with separately

Discussion

This section should include an analytical interpretation of the data, deliberation of the importance, validity and consequences of the results. Discuss bias, limits of accuracy, comparisons with other workers results. Deduce the limits of confidence for the material you have worked with. This is possibly the most important section of the report, use it well.

The discussion should not include a repetition of results but only indicate conclusions reached on the basis of them and those from other works referred to.

Under certain circumstances it may be advantageous to combine Results and Discussion but if possible separate them out to avoid long sub-sections.

Alternative structure of main text

The structure of Main Text described above may not be appropriate for all dissertations. In a Management, Economics, Marketing Review type report the structure could be very different, with a series of chapters reflecting different components of the study. For example *"A review of the effect of pollution on fish stocks in the Humber Estuary"* might be broken down as follows:

1) Introduction
2) The Humber Estuary
3) Water quality in the Humber
4) The Ecology of fish in the Humber
5) Institutional aspects of the Humber fisheries
6) Management of the Humber fisheries
7) Fish and pollution in the Humber

8) Fisheries economics and the Humber environment
9) Conclusions and Recommendations

Each of the above chapters should be able to stand alone and provide all the necessary material and cross referencing to describe and discuss what the section is about.

Whichever approach is adopted the Main Text should develop logically, the data collected should be relevant and it should be presented in a clear precise style.

Empirical evidence

Many research reports will include an analysis which lends itself to empirical enquiry and usually forms part of the discussion. Where this is the case it should be grasped. Evidence from relevant literature (books, journals, papers, lecture notes) should be included, but your own research material is also needed. If you intend to use data which you have gathered from your contacts with any organisation, check with someone in authority that its use is allowed. Similarly, do not quote statements and opinions expressed by other people with whom you might have had contact in your research without obtaining their permission.

Whilst researchers will need to draw on the work of many authors to support their discussion and conclusions, it should be emphasised that large sections of such sources should not be reproduced verbatim. Such evidence should be acknowledged and only regarded as supplementary to your own research. As a guide, no more than 10% of the report should reproduce other persons work. This should not prevent a review which is re-evaluating the work of many persons and attempting to put together a new synthesis or interpretation of the information.

Your primary research may involve the preparation and use of a questionnaire or a complex sampling programme. Before designing the sampling or composing the questions and collecting responses, consider the sort of statistical tools and any associated computer packages which may be used in the analysis. Then ensure that the nature and format of the material is suitable for the intended treatment. If you are in doubt, consult your research advisor. You are strongly recommended to seek such advice before embarking on data collection rather than afterwards,

Conclusions

These summarise the findings of the discussion section. The conclusions should not contain any new idea not previously introduced in the report. It should consist of firm, unqualified statements. It should conclude. It should be obvious to the reader that he has reached a natural finish to the report.

Recommendations

Often a reiteration of conclusions that have implications for modification of a scheme of work, process etc. Essentially concise and to the point.

References

All references cited in the text must be listed. The format for citation is given in Section 2.4.10. All published and unpublished material must be cited. Designated unpublished material (e.g. internal documents, reports, mimeo papers) should be listed as unpublished although the origin of the material should be indicated. Reference to personal communications should be indicated in the text (e.g. M. Mouse, personal communication) and omitted from the reference list. It is important that the method of citations and listing of references described in Section 2.4.10 are adhered to.

To assist you in preparing the reference list it is recommended you make a record of the reference as soon as you use it. This will stop you wondering where you got the reference when you compile the final list.

Appendices

These provide a convenient way of presenting detailed information, particularly of a descriptive nature, which, if inserted in the main body of the report, would interrupt the smooth flow of the narrative.

The sort of material that is relegated to the Appendix is experimental results, statistical data, tables and graphs etc. which do not directly support the presentation of information in the results sections.

2.3.5 *Presentation*

Preparation of final document

Printing

The report may be typewritten or word processed and output on a high quality, preferably laser or inkjet, printer. Text output on a high quality dot matrix printer MAY be acceptable, although it may not be possible to include subscripts and superscripts using this form of printer.

Paper

The report must be typed or printed on A4 size paper of good quality. Only one side of paper is usually use, although double sided can be used in long documents.

Number of copies

The project requires that fifteen bound copies of the report are submitted for dissemination to the project.

Text formatting

Textual material should be typed or printed using a clear 12 point typeface. If you are unsure of a font the default is usually Times New Roman.

Single spacing must be used for the summary (abstract), indented quotations, footnotes, formulae and diagrams, and may be used in Appendices and References. **Double spacing** or **1.5 spacing is usually used for all other textural material** throughout the report, although with the advent of laser printers it is now becoming increasingly common to use single spacing. In the case of large tables single spacing can be used.

Margins

The text should be printed on one side of the paper only, with a left-hand margin of at least 30 mm to allow for binding, and at least 25 mm for the other margin and at the top and bottom of the page.

Page numbers

EVERY page of the report must be numbered consecutively from beginning to end, beginning with the title page.

Section headings

When typing a report, it is best to establish consistency in formatting Section Headings to show the level of sub-sectioning. You may choose any style you wish but be consistent throughout the thesis. If you are unsure use the style used for this document which is shown below.

4.	**REPORT STRUCTURE**	**Chapter**
4.7	**Main text**	**Main section of chapter**
4.7.1	***Structure of text***	***Primary sub-section***
	Literature review	*Secondary subsection*

Editing and review of the report

Once completed, the report should be passed onto your colleagues and peers for comment. They should be constructively critical and you should evaluate their comments and incorporate them where appropriate. If they are destructive do not ask them again. Remember this is a constructive process and if asked to review a report of a colleague, be constructive yourself. It will lead to good working relationships and be a learning process in its own right.

The report should then be put down for a few weeks if possible. Come back and read it again. You may be amazed at what you wrote. If it is unclear or ambiguous in any way amend the text.

2.4 Common presentation requirements

There are a number of presentation skills which are common to both reports and papers. If these are followed from the onset they can save considerable time latter.

2.4.1 *Figures, tables, diagrams etc.*

These must be labelled and numbered separately. This can either be single order throughout the report, i.e. Fig. 1...., Table 1...., Scheme 1.... or a second order numbering system where the first letter or number indicates the Chapter or Appendix within which it is located, e.g. Table 1.1 or Fig. 2.3.

Figures, tables etc. may be embodied in the text or printed on separate (but numbered) pages which should be inserted on the page of text following the one on which they are first mentioned. The number should be followed by a heading and explanatory legend. Figures and tables should be understandable without the need to refer to the text.

Wherever possible, tables should be presented in "portrait" format, i.e. readable without turning the document sideways. Of course, wide tables may necessarily be printed in landscape format, but there are occasions when greater attention to setting out tabular information will avoid this format.

The minimum of rule (i.e. continuous lines) should be used in forming a table. Usually only horizontal lines need be used as illustrated in papers published in journals. Tables should start and end with a horizontal line. Adequate spacing is usually sufficient to separate vertical columns of data.

Tables should be captioned at the top along with the appropriate number, e.g. **Table 1.1.** (Title).

Figures and diagrams may be hand drawn (using black Indian ink and the appropriate drawing aids) or computer generated. The convention is to caption figures at the bottom, e.g. **Fig.** 3.1. (Title).

With graphs all axes must be titled. The title of axes should be given in the following order and style: Title, Notation, (Units) - as shown below:

Mass of residue, W (mg)
Length, L (mm)
Time (hours)

Note that the legends for axis should be along the axis and not, as is commonly found on the Y axis, across the top.

Photographs, usually referred to as plates, should be on single weight paper. The paper should preferably be the full size of the page allowing for standard margins around the photographs, but if this is impossible and it is necessary to mount small photographs on the page, a guard 12-mm wide, of the same thickness as the photograph should be mounted on the left hand edge of the page. Mounting should always be done by using photographic mountants as some glues can stain prints, whilst others lose their adhesive qualities with time.

Two of the key faults with figures and tables is that they are over-elaborate or do not convey the correct message. An example of two differently arranged tables containing the same information, but where the lower is much simpler to interpret is given below. Also note the simple use of lines to break up the table. No vertical lines have been used and no horizontal lines have been used to break up the data. This is common journal format and should be adopted. In complex tables presented in reports, it may b necessary to use a simple grid system, but do not over-elaborate the structure.

Table 6. Age and duration of illness: untreated and treated patients

	Number of Patients	Number of Deaths	Age at Death, years		Duration of Illness, years	
			Mean	Range	Mean	Range
Untreated Patients	802	340	65.9	38-91	10.8	1-41
Treated Patients	100	32	73.1	63-90	12.1	3-28

Table 6. Age and duration of illness: untreated and treated patients

	Untreated	Treated
Number of Patients	802	100
Number of Deaths	340	32
Age at Death, years		
Mean	65.	73.1
Range	38-91	63-90
Duration of Illness, Years		
Mean	10.8	12.1
Range	1-41	3-28

Tables are often used where a simple sentence in the text will do. For example, Table 7 below looks like a good table but it conveys such a simple message that it can be said in a single sentence: " The juvenile tilapia grew at temperatures between 20 and 35°C: no measurable growth occurred at temperatures below 20°C or above 35°C".

Table 7. Effect of temperature on growth of juvenile tilapia

Temperature (°C)	Growth in 28 days (mm)
10	0
15	0
20	2
25	7
30	15
35	6
40	0
45	0
50	0
55	0
60	0

As with tables, figures must also convey a useful message. An example of a clear, but unneeded, bar chart is shown in Figure 1. The figure can be replaced by one sentence in the text: "From the sample of 56 fish stomachs examined, six contained molluscs and 14 were empty".

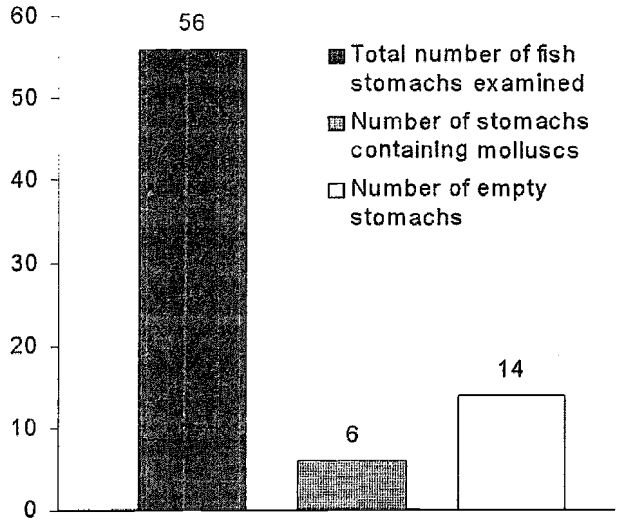


Figure 1. Number of fish examined that have empty stomachs or contained molluscs

Figures must not be crowded, watch size and dimensions: Usually figures are reduced during the printing process to a size that fits the actual journal, therefore do not make the originals bigger than a three times reduction can bare. Figures. 2, 3, 4, 5, 6 and 7 are examples of common faults and wrong presentations, and correct versions. Note: legends explaining the meaning of Figures 2-7 have been omitted for the sake of clarity.

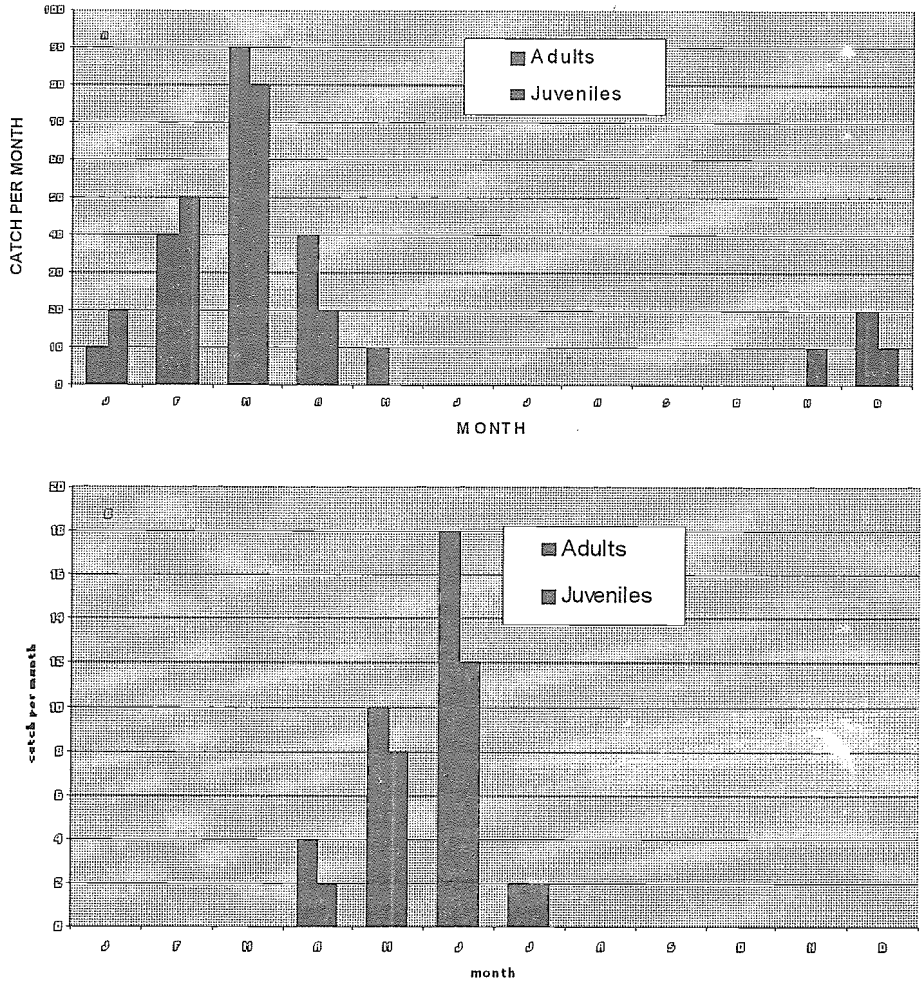


Figure 2. Common faults of draughtsmanship. 1, scales different in a and b; 2, insufficient contrast between columns for adults and juveniles; 3, inconsistencies in type and use of upper and lower case; 4, symbols a and b far too small; 5, excessive numbering on y-axis; 6, shading of background; 7, use of grid lines; 8, heavy black frame.

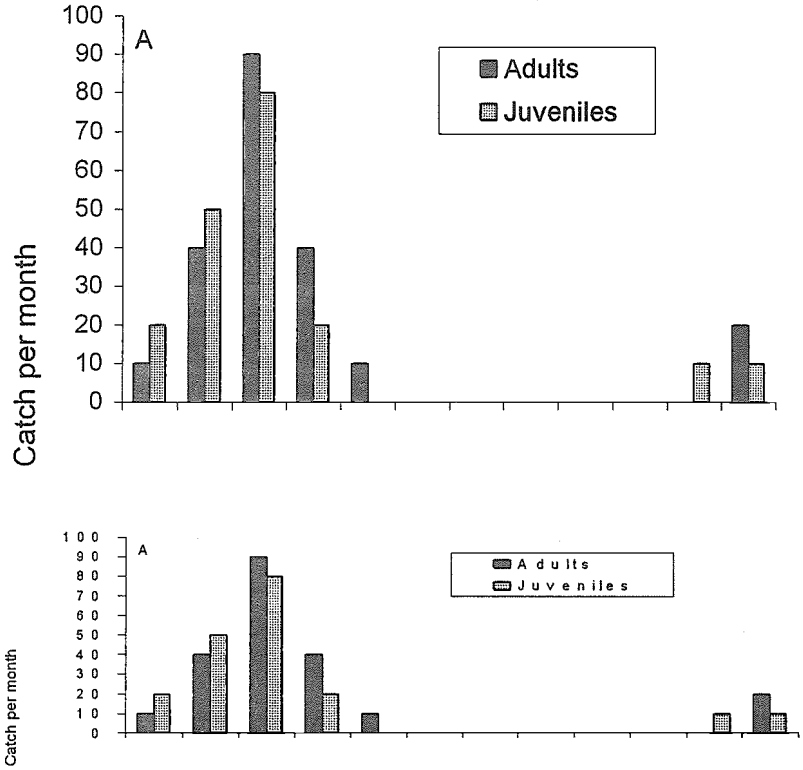


Figure 3. Clear presentation of the data in Fig. 2. 1, histograms on the same scale; 2, economy of the line and lettering; 3, contrasting columns for adults and juveniles; 4, correct use of type sizes to highlight the important features.

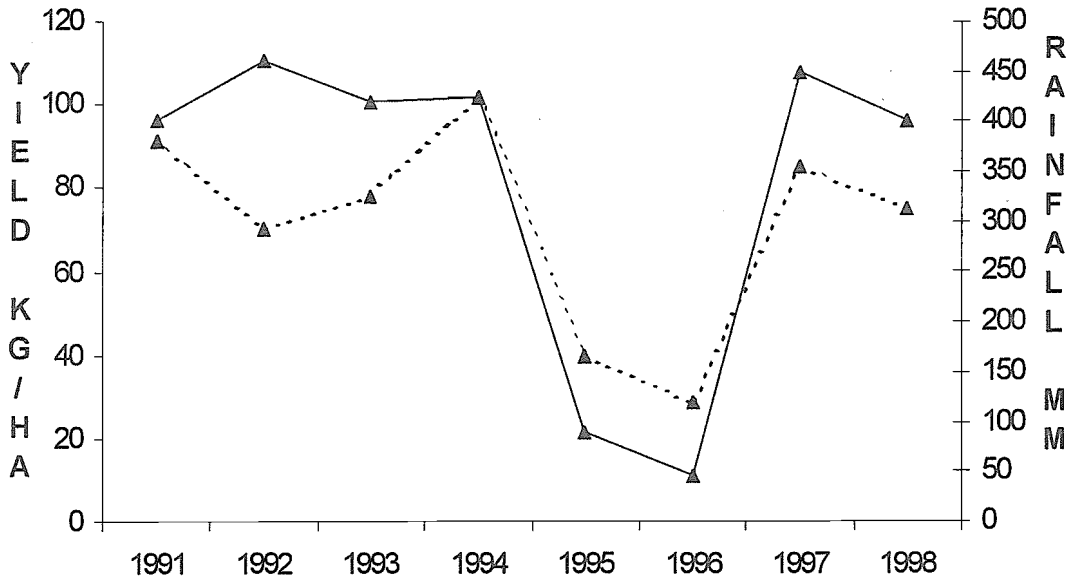


Figure 4. More common faults of draughtsmanship. 1, no key to symbols; 2, lines joined to the points; 3, the two graphs distinguished by symbol as well as type of line; 4, vertical lettering difficult to read; 5, use of bold lettering detracts from the appearance of the graph; 6, numbered years too far below X-axis.

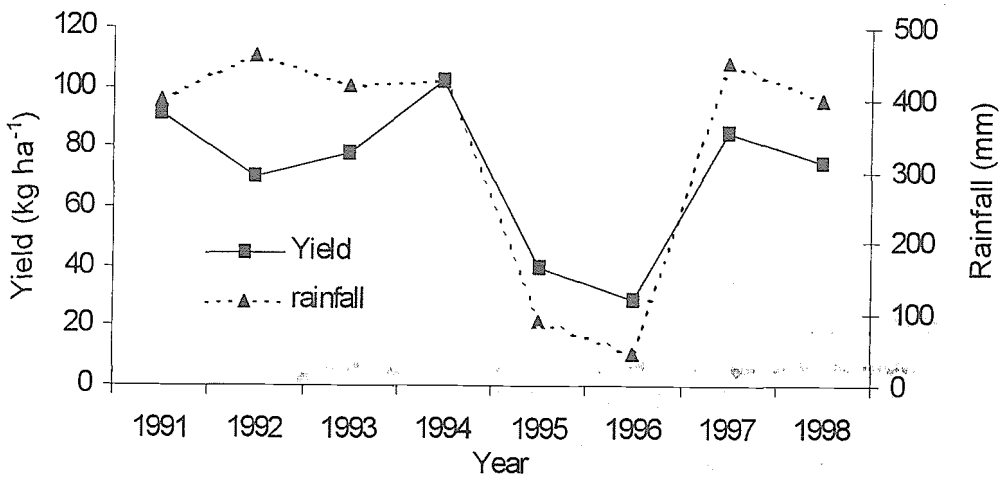


Figure 5. Correct presentation of data in Fig. 4. 1, a key included; 2, points made to stand out by breaking the lines; 3, graphs distinguished by symbol only; 4, correct positioning and arrangement of lettering.

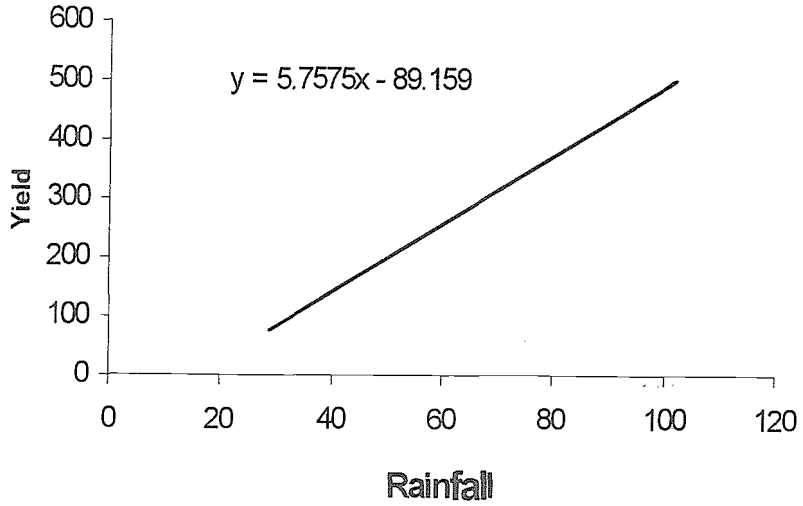


Figure 6. An uninformative regression line, with faults of draughtsmanship. 1, no units on x- and y-axes; 2, no data on derivation or accuracy of regression; 3, lettering on y-axis too small, on x-axis too large; 4, bold type for equation placing emphasis in the wrong place; 5, mixed type sizes in the word 'rainfall'.

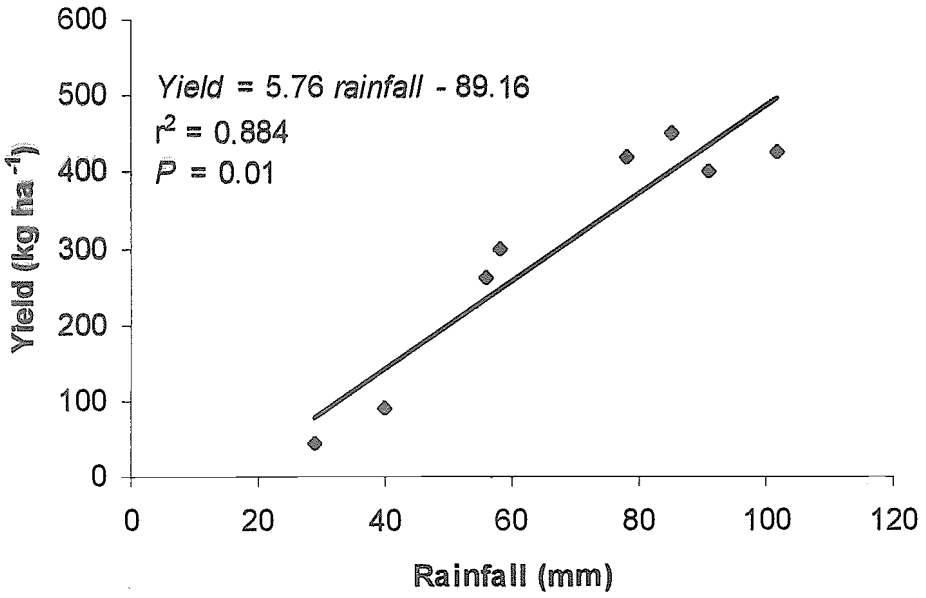


Figure 7. Correct presentation of Fig. 6. 1, units on x- and y-axes; 2, individual points and regression data given; 3, lettering of appropriate size and weight.

2.4.2 *Units*

The units of the System International (SI) are preferred. Other units are acceptable if they are of widespread use in the current literature. In their abbreviated form, symbols for SI units are the same whether singular or plural.

If the numerical value of the unit is either very large or very small, the recommended SI multiplying prefix can be used provided that consistency is maintained; thus 1500 m can be written as 1.5 km.

A compound adjective formed by a numerical value with its unit of measurement should be hyphenated, thus:

.... a 300-mm polythene pipe was used.

Avoid using 1 (el) for 1 (one) and O (oh) for 0 (zero); ensure that these characters are unambiguous in exponents. Explain special characters.

2.4.3 *Biological names*

Notation for biological species may be either printed in italics or if unavailable, underlined:

e.g. *Gammarus pulex* or Gammarus pulex

It is important the correct scientific name, and spelling, is given to the species when it is first used. If you are unsure check reference books This must also include the authority (i.e. the

first person to describe the species, e.g. Linnaeus or L.). Use the correct convention for brackets around the authority. Brackets are not used if the authority is the first person to describe the species. Brackets are used when the authority is redescribing the species and chamging its taxonomic position. For example, *Lates niloticus* (L.) but *Limnothrissa miodon* Boulenger. Check another text or reference book if you are unsure.

2.4.4 *Chemical names*

All chemical names should be described in their International Union of Pure and Applied Chemistry (IUPAC) form, guidance upon which may be sought from the Royal Society of Chemistry. Exceptions may be those chemicals that are known widely to non-specialists in a trivial form, e.g. Chloroform.

2.4.5 *Formulae*

The presentation of formulae can be extremely difficult and it is recommended that a package such as Microsoft Equation is used if you are going to use many formulae in the paper. However, there are a number of simple rules to apply for clear presentation.

Always use the correct international convention for the symbols you use in a formula. After first citation indicate what each symbol used in the equation means. Do not repeat for subsequent equations. This means that the symbol is fixed for the paper and should not be used for some other parameter or constant.

All symbols representing parameters should be in italics (e.g. t = time or W = weight). All mathematical expressions, numbers and constants (such as the gradient and intercept in a regression equation) should be in normal upright font [e.g. +, =, (...),.Σ, log, ln].

Always try to put the equation on a single line. For example, in the equation for estimating instantaneous growth (G) avoid:

$$G = \frac{\log_e W_2 - \log_e W_1}{\Delta t}$$

where W_1 and W_2 are the mean weight of the fish (in g) at the beginning and end of the time period t.

Instead it is better to use brackets and present the equation on one line as:

$$G = (\log_e W_2 - \log_e W_1) / \Delta t$$

2.4.6 *Abbreviations*

There is a distinction between an abbreviation and a contraction; an abbreviated work lacks its end and a contracted work lacks its middle. Thus:

Dr for Doctor
Chap. for Chapter

Common abbreviations (e.g. ATP, NADPH etc) should be routinely used without definition as should abbreviations the meaning of which is self-evident e.g. enzyme names: GS, GOGAT, PAL) should be defined in a footnote appended to the page when first mentioned. Avoid the use of too many non-standard abbreviations as they may render the text incomprehensible to the average reader.

2.4.7 *Acronyms*

The full name of an organisation should be given when first mentioned followed by its acronym in parenthesis. The acronym alone may be used thereafter. It is not necessary to put stops between each letter, thus Environment Agency (EA) and not E.A, or USA not U.S.A.

2.4.8 *Cross-referencing*

Writing a report invariably necessitates cross-referencing one part of a section to another. This is achieved simply by quoting the section by its number - for example, see Section 5.2.

2.4.9 *Sentences and paragraphs*

Wherever possible, sentences should be short and to the point. It is a common fault to make sentences too long by joining together a string of subsidiary clauses with conjunctives. Without lapsing into tabloid journalism, it should be possible to shorten sentences to about 20 words or so, thus giving the reader more easily assimulated pieces of information.

Combining sentences into paragraphs can produce similar faults so that a text may run for a half page or more without relief. Each paragraph should contain a similar level and type of information on the subject under discussion. Short paragraphs are preferred, although any tendency to treat a single sentence as a paragraph should be avoided. Typically, a paragraph may consist of five or six sentences; there is no hard and fast rule except that, when the natural break arrives, that is the point at which to conclude the paragraph.

2.4.10 *Referencing*

Citation

Citation of the reference in the text should be in the form:

We will illustrate this with some examples:

1. One article, one author:
   Cowx (1987) reported that...

2. Several articles (same year), one author:
   Cowx (1987a, b, c) reported that...

3. One article, two authors:
   Cowx and Tweddle (1987) reported that...
   ... is given by White and Newman (1982) ...

4. One article, several authors:

   Cowx *et al.* (1987) reported that...

   (NB. Some journals allow 3 or more authors to be named in full on first citation).

5. Several articles, several authors:

   Some studies (Cowx 1987; Cowx & Tweddle 1987; Cowx *et al.* 1987) have lead to severe misunderstandings and confusion...

   It was shown (Brown *et al.* 1978) that ...

6. Personal communication, unpublished articles:

   - (I.G. Cowx, personal communication) or (I.G. Cowx, pers. comm.)
   - (I.G. Cowx, unpublished data) or (I.G. Cowx, unpubl. data)
   - (I.G. Cowx, in preparation) or (I.G. Cowx, in prep.)
   - (I.G. Cowx, in press)

This should as far as possible be avoided, sometimes you can add year and address (NB. only with permission).

7. "Cited by": (cited by Cowx 1987); use this only if the original article is inaccessible, e.g. historical or rare documents.

Personal communications

(M. Jennings personal communication). This acknowledgement must appear within the main text itself and not within the reference list.

Listing References

The Harvard system should be used in which the author's name and date are cited: (Smith 1985), or if the author's form part of the sentence, Brown (1985). The references will be listed alphabetically at the end of the paper or report. Where an author or group of authors has published more than one paper in any one year, a distinguishing letter is attached e.g. Jones (1983a). Surnames only should be quoted in the text unless initials are required to distinguish between authors with the same surname e.g. N.V. Jones (1981) and O.T. Jones (1986). Where there are two authors both should be quoted, e.g. Smith and Jones (1983). Where there are three or more authors, they should be quoted by the first name followed by *et al.*, e.g. Smith *et al.* (1979).

In the reference list the entries should appear in alphabetical order of author's names. Papers with more than one author are listed after those by the first author alone and are grouped according to the number of authors: Jones 1981; Jones and Smith 1970; Jones, Bloggs and Zaccharius 1956.

The reference list should contain the title of the article in full and an accepted abbreviation of the journal (according to *World List of Scientific Periodicals* or to *Periodical Title*

Abbreviations (6th edn, L.G. Alkire Jr, ed.), Gale Res. Co., Detroit, M1, USA. Note some journals now require that the journal title is given in full. If in doubt, give the full title.

The following imaginary examples illustrate the style for the references.

The list includes;
1) listing papers in authored books;
2) listing books by authors;
3) listing books with the editor as author;
4) listing thesis;
5) listing conference proceedings;
6) listing non-published reports etc.

Jones B.A. (1986) Swimming in fish. *Journal of Fish behaviour* 52, 1-23

Jones B.A. & Hughes J.M. (1983) *How Fish Swim.* London: Spurious, 428 pp.

Jones J. (1984a) The eyes of fish. In: F.X. Baker (ed.) *Studies on Fish.* London: Spurious, pp. 76-94.

Jones J. (ed.) (1984b) *Fish Vision* (Proceedings of the XXth International Conference on Fish Senses, London, 2-6 April 1984). London: Spurious, 867 pp.

Jones J. & Baker F.X. (1982) *A Textbook of Fisheries*, 2nd edn. Atlantic City, NJ: Imaginary, 283 pp.

Jones J. & Smith C. (1981) Pollution and fisheries. In: Z. Brown & J.O. Tremblay (eds), *Major Influences on Fisheries.* Metropolis University, NY: Metropolis Press, 356 pp.

Jones J., Baker F.X., Smith C. & Roberts R. (1980a) Effect of turbidity on fish populations. Atlantis Technical Report on Aquatic Pollution No. 76 23 pp [Format for published report series.]

Jones J., Uyeda B. & Hara M (1980b) Detecting thermal effluent. *Japan Journal of Fish Physiology* 2, 17-29. (in Japanese, with English abstract).

Jones J., Adams D.J. & Roberts R. (1991) Origin of the Pisces. *Journal of Fish Evolution* (in press).

Kingsley A. (1980) Ecological interactions between *Rutilus rutilus* (L.) and *Leuciscus leuciscus* (L.) in lowland rivers. PhD thesis, Univ. Snowdonia. 444 pp.

Cowx I.G. & Crean K. (1993) Notes for guidance on preparation of research dissertation. University of Hull: HIFI, Unpublished manuscript, 12 pp.

Please ensure all the punctuation marks are included as illustrated. Listing reports and other unpublished literature should provide as much information as possible, including if possible the organisation, town country from which it originates and the number of pages.

If in doubt about how to quote references select a journal which publishes papers in your specialisation and use it as a model.

Do not cite papers that are in preparation or submitted. These should be cited in the text as: J. Jones, unpublished data.

2.4.11 *Style*

1. **Fog index.** Divide 100 words or nearest by number of sentences, add the number of words of three syllables or more (don't count words that are capitalised, combinations of short words, e.g. butterfly, verb forms made three syllables by adding 'ed' or 'es', e.g. created, trespasses) multiply the total by 0.4. The index is graded from 6 to 17. Six is moronic, 17 is unintelligible. Ten or eight gives good readability. The danger point is 12.

2. Aim for average of 20 words/sentence.

3. **Numbers.** Do not use numerals at the beginning of a sentence. Do not use two numerals in succession (two 2 inch bolts). Do not use numerals for round number estimates of ordinals (approximately two hundred parts; this is the third report). For numbers below ten, words tend to be preferred.

4. **Capitalisation.** Consistency is required. Capitalise only proper names.

5. Reveal meaning immediately and with minimum difficulty.

6. If you are not sure a word or phrase is necessary, leave it out!

Avoid:

Passive voice; abstract words; meaningless clichés and words; imprecision; unnecessary jargon; 'commercial English', unrelated participles – "using ..... it was found"; verbiage; predicates a long way from subjects; modifying clauses not close to the words they modify; strings of words and adjectives to modify noun, e.g.

It is assumed that....
It is apparent that...
It has been shown that ....
It is to be supposed that ....
It is considered that ....
It is proposed that ....
It was observed that ....
It was further noted that ....

Avoid inducement phraseology, it makes the reader suspicious and generally is inaccurate in its meaning.

It is obvious that... Obvious to who?

The data clearly show....	They do or do not show and it should always be clear. Indeed the data should show something so avoid this statement.
As you can see from the data...	Can the reader see the same points as the author?
It is interesting to note that....	It may be interesting to you but not all readers!!

Words robbed of all meaning or vague in themselves.

It is clear that...	Clearly
It was noted that if...	If
It is obvious that...	Obviously
It has a tendency to...	It tends
It is observed that fish which...	Fish which
For the reason that...	Because
Take into consideration...	Consider
If the improvements meant that....	If

Abstract tag words

Appreciable	Factor	Problem	Clearly
Case	Facilities	Real	Quite
Condition	Implement	Relatively	Rather
Certain	Overall	Situation	
Consideration	Practically	Tendency	

Prepositional phrases

A certain amount of....	Some
According as to whether...	If
A high (or low) degree of...	Some
As far as .... Is considered...	To
A the present time...	Now
For the reason that...	Because or Invert sentence to avoid entirely
For the purpose of...	
From the ... point of view...	In
Having a value of...	Of
Having (or with) regard to...	
In a number of cases...	
In connection with...	
In relation to...	
In spite of the fact that...	Despite
In the case of...	Here
In the event of...	
In the majority of instances...	Most of
Owing to the fact that...	Because
Provides a means by which...	enables
Referred to as...	
The former (latter)...	

With a view to...	
In view of the fact that	Because
The present situation whereby...	with

There are many more of these words and phrases to avoid – see Appendix 5.

Use

Shorter sentences; vary sentence length; clear simple English; familiar words; the average educated man's vocabulary is 15 000 words of which 5000 are special to him, e.g. chemist, fisheries scientist, don't assume too readily that people understand you.

Think more of reader and less of personal satisfaction; wide margins; double spacing; good layout and artistry; good appearance; friendly, relaxed, homely style; rhythm; moderate use of repetition, metaphors, summarising phrases.

2.5 Check list before submission

Is the purpose of the paper/report clear: the places to look – title, introduction, summary.

1. Is the report suitable for its intended readers? Distinguish between primary to tertiary readers. What are their needs. How will they use the information? Will they accept its assumptions explicit or implied? Will they find the explanations adequate? Will they find the technical level appropriate? Find the non-technical language appropriate?

2. Is the report/paper effective? Does it achieve its intended purpose? Is the conclusion clear and emphatic?

3. Comprehensiveness. Is everything necessary included? Does the title mislead. Do you keep all your promises?

4. Relevance. Is everything unnecessary excluded? Is the degree of relevance maintained?

5. Development. Is the subject developed in an appropriate 'logical' order? Is the reader informed of the proposed development?

6. Balance. Are the component parts given appropriate weight?

7. Arrangement. Is it easy for the reader to see the structure of the report/paper? Easy for him to refer back? Do your headings agree with the table of contents and the plan announced in the introduction? Do the headings help to explain the information listed beneath them?

8. Introduction. Does it introduce? Does it explain the status and scope of the report? Does it define the limits? Does it indicate the proposed development? (Too much historical background before the purpose is clear annoys the reader.)

9. Abstract/Summary. Does it summarise? Is it concise? Is it adequate? Is it informative? Is it independent of the report? Check there are no after-thoughts?

10. Conclusion. Does it conclude? Is it clearly and cogently expressed?

11. Appendices. Are they necessary? Are they appropriate? Are they mentioned in text?

12. References. Are they adequate? Are they clearly made?

13. Format and layout. Is it attractive? Is it pleasant to the eye?

14. Symbols. Conventional when necessary? Well chosen when otherwise?

15. Mathematics. Are they necessary? Are they desirable? Are they appropriate to intended readers?

16. Vocabulary. Is it too simple or too abstract? Is it full of meaningless phrases? Are the sentences of reasonable length?

17. Diagrams. Do they convey the message clearly? Are the associations between text and illustrations clear and as close as possible? Do they contain the necessary minimum of explanatory wording? Are the headings precise and informative?

2.6. Final tips

i) A good idea is to select a journal which publishes papers in your specialism and use it as a model for your report.

ii) Be consistent with regard to headings, table layouts, use of symbols in figures, abbreviations etc.

iii) Do not leave the write up until last minute.

iv) Do not be afraid to seek advice.

3 HOW TO ACHIEVE A SUCCESSFUL PRESENTATION

3.1 Planning

Most scientists and researchers attend conferences and listen to talks by other scientists. What makes one presenter better than others. It is always an advantage to have been especially invited to speak to an audience. However, if you seek to make a presentation your position is altered: it becomes more of a selling situation.

Planning your presentation will help to reduce tension and ensures that it will be oriented towards what your audience requires or needs and wants to hear rather than to what you, the speaker, wants.

Since planning is simply a disciplined process of thinking about what you are going to do and how you are going to do it, the first thing to plan is the presentation objective.

While the overall purpose of every presentation is likely to be to persuade and to influence, you need to define your objective in more precise terms. A useful way of defining your objective is to ask yourself: "At the end of my presentation what message do I want my audience to take away?".

The answer provides the introduction to your presentation, keeps you to the point and finally provides the inspiration for your closing words.

Once you have defined your objective, you should establish the nature of your audience so that you can decide what it needs to know.

It is important to find out who will make up the audience. Establish whether it will be mixed or single sex; establish the age group and predominant occupations, backgrounds, cultures, and opinions. Establish, too, what the audience will expect from the presentation and whether it will respond at the end by asking questions. All this information will help you to discover whether, and how, the audience can be influenced or guided.

Having arrived at the objective of your presentation, choose a title for it. A title provides a point of interest for the audience and a theme for what you want to say. And, of course, the chances are that those responsible for organising the occasion will need a title to print in an advance notice and the chairperson will require one for his or her introduction. Titles of talks can be provocative statements or open-ended questions.

For simplicity, the structure of any presentation should always be based on the listener's point of view and should be divided into three fairly obvious main parts: the beginning; the middle, and the end.

The beginning should flatter the audience's sense of self importance and demand for consideration. The presenter should concentrate on building a rapport, getting complete attention, and stating the themes of the talk.

The listener's point of view during the middle part of the presentation is likely to take the form of three questions: will the ideas being presented help me, what are the facts, and what are the snags?

The presenter should satisfy the audience's needs by providing all the relevant information, by anticipating objections and concentrating on advantages. Support material such as visual aids and third party references will be extremely useful at this stage.

Finally, the audience should be brought to the point where it will approve and agree with what is being presented. Achieving this will be made simpler with a resume of themes and relevant facts and a final few words of commitment.

Apart from reducing tension and ensuring an audience-oriented presentation, a structure has other important advantages for a speaker. It enables the audience to follow easily and ensures every mental demand by the audience is covered; it provides a secure framework to fall back on if the audience is invited to ask questions during the presentation and leads the speaker astray; and it provides a disciplined and logical basis on which the speaker can plan his presentation.

As a presentation divides almost naturally into three parts, many speakers prepare their talks on a framework of the three-times-three rule. Select up to three main points or objectives for your talk, but never more. Then make those points three times based on the speaker's famous formula: tell them everything at the beginning, in the middle and at the end.

This formula acts as a double insurance. When an audience is listening to a presentation, it goes through a known pattern of attention. At the beginning, audience attention is high but after the first ten minutes it diminishes. Then people tune in again and listen closely to the speakers' final remarks. Armed with this knowledge you should plan to cover the important points at the start and state them again at the end.

One of the secrets of successful speaking is knowing how to write down what you propose to say in notes to which you can refer easily – and not become the prisoner of a sheath of closely written material which lose you the attention of the audience.

It is equally dangerous to try and memorise your speech so that you do not have to use notes. The result will either be disastrous or a glib presentation that lacks warmth, sincerity, emotion and spontaneity.

For a talk or presentation of any length it is best to write down what you plan to say in detail. Then select the key sentences or words that summarise each section. As you do this speak them out aloud to yourself to hear how they sound. Some phrases that read well do not have the same impact when spoken.

Then print these key sentences and words in large capitals on to card so that when they rest on the table or lectern from which you are to speak they will be easy for you to read.

Use either blank postcards or lined index-type cards sized 15 x 10 cm. Keep the number of words on each card to a minimum, but make sure that you write out in full your opening sentences and closing words. These are the two most important elements of your presentation

and the parts that you should try and memorise so that when you start and finish you are looking at you audience and have full eye contact with it.

The other items in a speech or presentation that should never be abbreviated are quotations and statistics, and make sure that you get them right.

Never rely on your memory because it is sure to let you down and you will misquote. If you do, there are always one or two people in your audience who will know that particular quotation correctly and if they spot you are getting one thing wrong they are likely to dismiss everything else you say as just as inaccurate. The same applies to statistics.

It is always tempting when preparing a presentation to try to be as up to date and topical as possible by referring to that evening's newspaper headlines or to a major story that has appeared in all the morning's daily papers.

In reality, it's best not to quote such stories or news items if they are less than 24 hours old because surprisingly few people will have had the same motivation or interest to read them as you have.

Once you have assembled your thoughts and ideas and printed them on cards to create the final material for your presentation, you should bring them together so that they do not get out of order.

Number each card in sequences on the right hand side and indicate by number any visual aid you plan to show at that stage; punch a hole in the top left hand corner of each card and then link them all together with a treasury tag. Review your whole presentation card by card; you may wish to highlight certain words or passages by underling them or by using different colours. Finally, never delegate the task of preparing and assembling your notes to anyone else.

Having prepared your notes, you must now prepare yourself. Remember that only those without talent do not have stage fright before making a presentation. But you can reduce your anxieties by self-preparation.

Good presentations are neither parrot-memorised recitations nor word-for-word readings. Read your presentation aloud to yourself to familiarise yourself with the contents. Pinpoint any words that need careful pronunciation such as a person's name or a place.

It is wise to use a tape recorder to record and play back your presentation. It is a useful guide to timing to remember that you speak about 130-150 words a minute. Another useful guide is to have on your speaking cards an outline of notes for at least five minutes material per card.

If possible, rehearse at the place where you are to speak so that you get the feel of what it will actually be like. Ask a group of friends to listen to your rehearsal and get them to play the devil's advocate by giving you their constructive criticisms. If you can assemble not only a group of colleagues but also have access to a recording camera and closed circuit television, then your rehearsal can be more thorough.

Beware, during such a rehearsal, of a last minute panic and a desperate search for something humorous or a funny story to lighten what sounds like a boring presentation. Imported humour is always risky. Avoid trying to be humorous. Much better to think of all the ridiculous, bizarre or embarrassing situations you have been in and draw upon these to tell a story or joke against yourself. You will be agreeably surprised at how effective this can be.

When you find yourself speaking to an audience of mixed nationalities whose first language is not English, slow down your speed of delivery to about half of that you would use when talking to an English-only audience; decelerate from about 130-150 words to about 60-90 words a minute.

Remember that although the non-English members of your audience may speak English, all the time you are speaking many of them will be mentally translating what you say back into their own language before entirely understanding.

Another factor to watch out for when presenting to such mixed audiences is the danger of using slipshod English, slang or words that have no exact translation or, when translated, have a different meaning.

Don't use such phrases as "No way" when what you really want to say is "Not possible". Similarly someone who is not fluent in English would find slang such as "Put the screws on" incomprehensible, so why not say "Put pressure on"?

3.2 Techniques of effective self-presentation

3.2.1 *Preparation*

Collection
Write down on a large sheet of paper all relevant aspects; let your mind range freely over the subject and write the headings on a 'spider diagram'.

Selection and rejection
Filter this material by reference to the following questions:

- who are my audience and how much do they know already?
- what do I want to tell them and how much time am I allowed?

Research and add further information to make sure the learning objective is met.

Final notes
These should be made on a postcard indicating the sequence to be followed via main headings and sub-headings; and perhaps a few key words added as a reminder of points which must be raised, e.g. time scales, costs, specific planned questions etc.

WRITE THESE NOTES ON THE POSTCARD IN CAPITALS

If you need to quote, then write these in full on a separate card.

Number and/or bind your cards in the correct sequence.

3.2.2 *Structure*

A presentation will normally have an introduction, a middle, and a conclusion.

Introduction
Both parties should use this opportunity to relax, to get used to the surroundings, and to tune in to the sound of the voices. Secondly, the introduction should be used to provide an overall picture of the content to be covered, the sequence of topics, the duration, and nature of audience participation, if any.

Middle
This is the main part of the presentation where your final notes are used; tick off (mentally or otherwise) the points as they are covered, making absolutely certain that your 'key' points are communicated in the most convincing and empathic manner possible.

Conclusion
The purpose of this part is to sign off: do so by re-capping, summarising and repeating any items to be followed up under 'future action'. Prepare properly for this conclusion – don't cut it too short, or repeat verbatim the middle section.

3.2.3 *Presentation*

No matter how good your preparation, it can fail through bad presentation. You will find, however, that, after a little experience, it is the easiest and arguably the most enjoyable part of the work.

Certain points need to be borne in mind while making the presentation but eventually they will become automatic.

Nervousness
Feeling keyed up is perfectly normal and to be expected. It may be helpful to take deep breaths (increase oxygen intake) and to concentrate on relaxing the wrists. Adequate preparation along the lines suggested helps increase confidence.

Dress
Tidy yourself up before you go into the meeting – straighten your tie, button up your jacket etc. Don't put your hands in your pockets – it's slovenly and may give offence.

When you sit, avoid slumping over the table or slouching in the chair. Keep your hands on the table in front of you, and don't fidget with your notes or pencil or cigarettes – it distracts.

Use of notes
Don't be afraid of letting people see you have notes. You may keep your cards in your hand, but don't wave them about.

If you have a number of notes for reference, see that they are in the correct order before you begin – don't shuffle them around.

Audience contact
You will never gain the attention or interest of your audience unless you look at them. Don't gaze at the ceiling or though the window – they will gaze and speculate on what you have seen.

The other extreme is to transfix your gaze on one particular member of the audience: regardless of the attraction or otherwise, this is not advisable since it may embarrass him/her, however sympathetic that person may be. Distribute your favours evenly, and let everyone feel you are talking to them personally.

Language
Avoid pomposity, official type language, and technical jargon – unless it is understood completely by the audience.

Use precise words rather than woolly ones, and be natural at all costs.

Mannerisms
If you take care of your hands and feet, you're likely to avoid most of the distracting 'body-language' mannerisms.

Ask someone to tell you which 'word' or 'non-word' mannerisms occur frequently in your presentation, or check your performance on video.

Voice
Aim to convey an impression of authority and enthusiasm about the subject.

PAUSES – These can be used to good effect, but pause between sentences, not in the middle of them. They fulfil two purposes:

- they allow the speaker to collect his thoughts before passing on to the next topic;
- they allow the audience to digest and ponder on what has just been said.

PACE – speak reasonably slowly, but vary the pace.

PITCH – avoid a monotone and do not drop your voice at the end of a sentence.

POWER – vary the power continually: neither the sustained stage whisper nor the prolonged bellow will hold your audience for long.

Visual aids

A blackboard, slides, charts and graphs may help to add interest. However, visual aids should not be used indiscriminately – they may have the reverse effect of distracting the listener and breaking his train of thought.

Use slides , view-foils or flip-charts for items which:

- cannot be easily described;
- compare and contrast;

- are boring, difficult to follow, but important;
- require a question and answer approach, e.g. "Study this statement ..... and write down your initial reaction to it".

Remember that presentation of graphs and tables should be simple. They should be easily understood and of a size that can be read by the audience at the back of a large hall. How often do you see a table with large numbers of columns and rows of figures and comment on their illegibility? Don't do it yourself. As a rule of thumb:

- only present tables with a maximum of three columns and four rows;
- only present a maximum of three lines or data series on a graph or bar chart;
- highlight the key points you are trying to display;
- give a title to the graph or table so the audience can read what you are trying to present.

Eyes and ears

Finally, do remember to use your eyes and ears:

LISTEN to the question – don't answer a question that you **think** is being asked. If you're not sure about something, then seek clarification.

LOOK for clues regarding audience reaction, and modify your presentation as you see fit.

Apologies

Never apologise for:

- your poor language skills;
- your poor visual aids.

Both of these can be overcome by good preparation.

3.2.4 *Effective self-presentation*

Principles

1. Sender responsible for gaining understanding. Must put himself in the mind of the receiver.
2. Sender gets better results from 2-way communication. Must listen as well as talk.
3. Sender thinks he has got more across than he has. Must check continually for understanding.
4. Receiver thinks he has understood more than he has. Sender must check for understanding.
5. Some misunderstanding is inevitable, particularly in a group situation. Sender must anticipate this by continual testing.
6. More time is necessary for two-way, as opposed to one-way, communication. This calls for more careful planning and control of time by sender in two-way communication.

Characteristics of a good speech, talk or presentation

1. It must say something worth saying.
2. It must be so phrased as to seem original and interesting throughout, and be stamped with the personality of the speaker.
3. As far as possible, it should be devoid of 'waffle', and it should make its points clearly, concisely and directly.
4. There should be one or two highlights which should be particularly stressed, so that, if nothing else, people will be able to remember and quote these points.

Essential qualities of the spoken word

1. Immediate comprehension
2. Persuasive quality
3. Ability to express the finer shades of meaning.

Appendix 1

Aims and objectives of an international journal

Fisheries Management and Ecology

EDITORS

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EDITORIAL POLICY. *Fisheries Management and Ecology* is an international journal that publishes papers on the management, ecology and conservation of inland, estuarine and, where appropriate, coastal fisheries. The aim of the Journal is to foster an understanding of how to maintain, develop and manage the conditions under which fish populations can thrive, and how they and their habitat can be conserved and enhanced. It will promote a wider and fuller understanding of the dual nature of fisheries as valuable resources exploited for recreational and commercial purposes and as pivotal indicators of river/estuary quality and conservation status.

The Journal is published in association with the Institute of Fisheries Management (IFM) and is the successor to *Fisheries Management.* The IFM is an international organisation whose aim is to promote the profession of fisheries management through the award of recognized qualifications and the dissemination of relevant knowledge.

Appendix 2

Notes for authors from *Fisheries Management and Ecology*

Three copies of each manuscript (in English) should be submitted to

Dr I Cowx, University of Hull
International Fisheries Institute
Hull, HU6 7RX, U.K
(Tel: 01482 - 466421)
(Fax: 01482 - 470129).
(Email: i.g.Cowx@biosci.hull.ac.uk)

To assist publication authors will be requested to submit a copy of their final manuscript on disk. Information about submission on disk will be sent to authors once the paper has been accepted for publication.

Papers are accepted on the understanding that they have not been and will not be published elsewhere. Papers become the copyright of the Journal.

Preparations of typescripts

Manuscripts should be typed (with a wide margin), double spaced, on one side of A4 (30x21 cm) paper. In general papers should not be more than 15 double-spaced pages long, including tables, figures and references. They should be written in such a way that they communicate the message simply and clearly.

The title page should contain the full title of the paper; the full names of all the authors; the name(s) and address(es) of the institution(s) at which the work was carried out (the present address(es) of author(s), if different from above, should appear in a footnote); the name, postal address, email address, and telephone and fax numbers of the author to whom all correspondence and proofs should be sent, and a suggested running title of not more than fifty characters, including spaces.

The first page of text must provide the title of the paper (but not the author's name(s) or affiliations), a short abstract not exceeding 150 words and up to six key words to aid indexing. The text should then proceed to sections on Introduction, Materials and Methods, Results and Discussion. Please use the journal format for headings. i.e. sentence case in bold for main headings and sentence case in italics for subheadings (see sample copy of the journal for reference). Pages should be numbered consecutively in Arabic numerals, but tables, figure legends (including magnifications) and acknowledgements should be submitted on separate sheets. Tables and figures should be referred to in the text together with an indication of their appropriate position recorded in the text margin. Authors should retain one copy of text, tables and illustrations as the Editors cannot accept responsibility for damage or loss of manuscripts. Overseas authors may wish to consult an appropriate member of the Editorial Board prior to submission of material.

The full Latin specific name, including the authority with correct taxonomic disposition, should appear at least once for each species when first mentioned in the text or elsewhere, thus: Atlantic salmon. *Salmo salar* L., turbot, *Scophthalmus maximus* (L.), snakehead, *Channa punctatus* (Bloch), rainbow trout, *Oncorhyncus mykiss* (Walbaum), i.e. authorities bracketed depending on first description (for further information see American Fisheries Society Special Publication No 12 *A List of Common and Scientific Names of Fishes from the United States and Canada).*

The reference list should be in alphabetical order and include the full title thus:

Chapman D.W. (1971) Production. In: W.E. Ricker (ed.) *Methods for the Assessment of Fish Production in Freshwater.* Oxford: Blackwell Scientific Publications, pp. 199-214.

Wickens J.F. (1972) The food value of brine shrimp *Artemia sauna* L., to larvae of the prawn *Palaemon serratus* Pennant. *Journal of Experimental Marine Biology and Ecology* 10, 151-170.

Jones J., Adams D.J. & Smith F.D. (1989). Effect of turbidity on fish populations. *Atlantis Technical Report on Aquatic Pollution* No. 76. 23pp. [Format for unpublished reports]

When referencing a book or report please include the number of pages in the document.

References in the text should use the Harvard System and be in full on first mention, e g. (Brown, Smith & Williams 1975), subsequently abbreviated to (Brown *et al.* 1975). Authors are responsible for the accuracy of their references. References should only be cited as 'in press' if they have been accepted for publication. Manuscripts in preparation, unpublished reports and reports not readily available should not be cited but referred to as unpublished in the text. Personal communications should be cited as such in the text, e.g. (P. Black, personal communication).

Spelling should conform to The Concise Oxford Dictionary of Current English. Units of measurement, symbols and abbreviations must be given in metric units but British or other equivalents may be included in parenthesis. Where any doubt arises as to the correct abbreviations, reference should be made to Quantities, Units and Sybols. 2nd edition, 1975, published by the Royal Society, London (ISBN: 0 85403 071 9). Full stops are not used with abbreviations. The following are suggested as internationally accepted units: %, ^{o}C, mm, cm, cc, mL, L, m, km, mg, g, kg, s, min, h, ha.

Illustrations should be labelled with the figure number and author's name in soft pencil on the back identifying the top edge. Photographs should be glossy bromide prints of good contrast and well matched, mounted on card and with a transparent overlay for protection. The overlay would be used to indicate masking instructions, lettering or arrows. Specific features may be identified for electron micrographs either directly on the prints or on the overlay. Scales may be indicated on the overlay or magnifications included in the figure legends. Photographs should not exceed 200 x 124 mm and authors may be asked to contribute to the cost of printing if the space requested for illustrations is considered excessive. In the case of electron micrographs it is desirable that full page width should be utilized. Colour photographs will be allowable but the authors will be required to contribute towards the cost of reproduction. which is often high. Line diagrams can be computer generated but must be produced by laser printer. Alternatively they should be drawn with black ink on tracing paper

or white card or supplied as glossy prints. Figures should not contain detail that may be lost when reduced in size for printing.

Page proofs will be sent to the author's address on the title page and should be returned to the publishers within 3 days of receipt. Alterations in the text other than corrections may be charged to the author.

Management and ecological notes

These should differ from full papers on the basis of scope or completeness, rather than quality of research. They may report a new or modified techniques or methodology, significant new data arising from problems with narrow, well-defined limits, or important findings that warrant rapid publication before broader studies are complete. Their text should be not be longer than 5 pages of double-spaced typescript, including references and one table or figure, nor be divided up into conventional sections. When submitting Management and Ecological Notes, authors should make it clear that their work is to be treated as such.

Appendix 3

Referee's report form for *Fisheries Management and Ecology*

MANUSCRIPT REVIEW

REF: FME/

Dear

Paper entitled .....

.....

.....

DATE FOR RETURN OF REVIEW .....

This manuscript has been submitted to *Fisheries Management and Ecology (FME)* and I should be most grateful if you can provide a review. At the discretion of the editors, *FME* has adopted blind refereeing so authorship of the manuscript may not be revealed to reviewers.

To avoid undue delay between submission of the manuscript and its possible publication please return the review, with the manuscript, not later than the date shown above. If you anticipate a substantial delay beyond this date, please return the manuscript to me as soon as possible so that I can obtain an alternative review.

FME publishes both Regular Papers and Short Management and Ecological Notes with the aim of fostering an understanding of how to maintain, develop and manage the conditions under which fish populations can thrive, and how they and their habitat can be conserved and enhanced. Papers on pure ecology, which have no management or policy perspective are not normally accepted, although information on the ecology of new species or species in new environments are considered valuable if they improve our understanding of that species. Articles which use basic scientific results for applied purposes are encouraged.

Maintaining a high professional standard in *FME* relies heavily on the continued efforts of the reviewers. If you yourself feel unable to deal with the enclosed manuscript please feel free to consult a competent colleague or to return it to the Editor. Please consider if the contribution is excessively long and if so make suggestions for shortening it.

Please put your confidential comments for the editor on the reverse of this sheet and put your comments to be communicated to the author on the page headed "Reviewer's Comments (for author)". This page can be detached to feed through a printer.

Thank you for your help in refereeing and editing this manuscript.

Yours sincerely,

REVIEWER'S COMMENTS (FOR EDITOR)

Overall acceptability

Is the paper acceptable (go to A) or unacceptable (go to B)?

A: ACCEPTABLE

i Without change Yes/No

ii With minor revision? Yes/No
(to be checked by the Editor only)

iii With major revisions Yes/No
(may be sent back to the referee)

B: UNACCEPTABLE because:

i Scientific content is of poor quality or trivial Yes/No

ii Work is only of local interest Yes/No

iii Of very poor presentation Yes/No

Specific comments

The following questions should be answered as necessary:

1 Does the manuscript conform to *FME* policy? Yes/No

2 Does the title conform with the contents of the manuscript? Yes/No

3 Is the abstract appropriate, summarising methods, programme of results and conclusions? Yes/No

4 Are the key words informative? Yes/No

5 Does the manuscript present a significant original contribution to knowledge? Yes/No

6 Are the interpretations and conclusions justified by the data? Yes/No

7 Are the facts and interpretations clearly distinguished? Yes/No

8 Is it clearly written and are terminology and expression appropriate for a general but professional readership? Yes/No

9 Is the organization satisfactory? Yes/No

10 Are the illustrations/tables and their captions necessary and adequate? Yes/No

11 Is sufficient credit given to prior work? Yes/No

12 Are the references necessary, adequate and accurate? Yes/No

Your answers can be expanded in the space below:

Date..... Signature.....

Kluwer academic publishers

PROOF CORRECTION MARKS TO BE USED BY AUTHORS

MARGINAL MARK	MEANING	CORRESPONDING MARK IN TEXT
dl	Delete (take out)	/ or ⊢ Cross through
dl	Delete and close-up	Above and below matter to be taken out
stet	Leave as printed (when matter has been crossed out by mistake)	····· Under matter to remain
caps	Change to capital letters	≡ Under letters or words altered
l.c.	Change to lower case letters	Encircle letters altered
bold	Change to bold type	~~ Under matter altered
bold ital	Change to bold italic type	≈ Under matter altered
ital	Change to italics	— Under matter altered
rom	Change to roman type	Encircle matter altered
×	Replace by similar but undamaged character or remove extraneous marks	Encircle letter to be altered
⋎	Insert (or substitute) superior figure or sign	⋏ or /
⋏	Insert (or substitute) inferior figure or sign	⋏ or /
⌢	Insert (or substitute) hyphen	⋏ or /
2em 1–1	Insert (or substitute) dash	⋏ or /
(/)	Insert (or substitute) solidus	⋏ or /
···	Insert (or substitute) ellipsis	⋏ or /
⌢	Close-up–delete space	⌢ Linking words or letters
#	Insert space	⊺ or ⊤ Between items
equal #	Make spacing equal	⊺ Between items
⊤	Reduce space	⊺ or ⊤ Between items
⋋	Insert space between lines or paragraphs	
←	Reduce space between lines or paragraphs	
⌐¬	Transpose	⌐¬ Between letters or words, numbered when necessary
⊆	Transpose lines	⊆
centre	Place in centre of line	] [Around matter to be centred
⊢⊂	move to the left	⊐
⊂⊣	move to the right	⊂
NP	Begin a new paragraph	□ Before first word of new paragraph
run on	No fresh paragraph here	⟶ Between paragraphs
⋏	(Caret mark.) Insert matter indicated in margin	⋏
⸌ ⸍ ⸌⸌ ⸍⸍	Insert single/double quotes	⋏ ⋏

Remarks

To indicate a substitution, simply cross out the letters or words to be replaced, and write the correct letters or words in the margin. It is not necessary, nor even desirable, to use the marks for *delete* and *insert* when making a substitution. If there is more than one substitution in a line, place them in the correct order in the margin, and indicate the end of each correction with an oblique stroke / . Alternatively, continental location marks may be used, but these are to be placed in front of the corrections, not behind as in the case of the oblique stroke.

The typesetter treats *all* letters and words in the margin as insertions or substitutions, so – to avoid misunderstanding – any comments *not* intended to form part of the text should be encircled.

All alterations should be marked clearly so that there is no risk of misunderstanding; long additions or amendments should be typed on separate slips and attached. *Only really essential alterations should be made at proof stage.*

In addition to reading the proofs, please look through your edited manuscript to see if there are *any queries from the copy editor*, and if so, answer the queries *on the proofs*.

Appendix 4

Proof correction marks to be used by authors

Appendix 5

Words and expressions to avoid

Jargon	*Preferred Usage*
a considerable amount of	much
a considerable number of	many
a majority of	most
a number of	many
a small number of	a few
absolutely essential	essential
accounted for by the fact	because
adjacent to	near
along the lines of	like
an example of this is the fact that	for example
an order of magnitude faster	10 times faster
are of the same opinion as	agree
a consequence of	because
as a matter of fact	in fact (or leave out)
as is the case	as happens
as of this date	today
as to	about (or leave out)
at a rapid rate	rapidly
at an early date	soon
at an earlier date	previously
at some future time	later
at the conclusion of	after
at the present time	now
at this point in time	now
based on the fact that	because
by means of	by, with
causal factor	cause
completely full	full
consensus of opinion	consensus
considerable amount of	much
definitely proved	proved
despite the fact that	although
due to the fact that	because
during the course of	during, while
during the time that	while
elucidate	explain
enclosed herewith	enclosed
end result	result
entirely eliminate	eliminate
eventuate	happen

Jargon	*Preferred Usage*
fabricate	make
fatal outcome	death
fewer in number	fewer
finalize	end
first of all	first
following	after
for the purpose of	for
for the reason that	since, because
from the point of view of	for
future plans	plans
give an account of	describe
give rise to	cause
has been engaged in a study of	has studied
has the capability of	can
have the appearance of	look like
having regard to	about
impact (v.)	affect
important essentials	essentials
in a number of cases	some
in a position to	can, may
in a satisfactory manner	satisfactorily
in a very real sense	in a sense (or leave out)
in almost all instances	nearly always
in case	if
in close proximity to	close, near
in connection with	about, concerning
in many cases	often
in my opinion it is not an unjustifiable assumption that	I think
in order to	to
in relation to	toward, to
in respect to	about
in some cases	sometimes
in terms of	about
in the absence of	without
in the event that	if
in the not-too-distant future	soon
in the possession of	has, have
in view of the fact that	because, since
inasmuch as	for, as
incline to the view	think
initiate	begin, start
is defined as	is
it has been reported by Smith	Smith reported
it has long been known that	I haven't bothered to look up the reference

Jargon	*Preferred Usage*
it is apparent that	apparently
it is believed that	I think
it is clear that	clearly
it is clear that much additional work will be required before a complete understanding	I don't understand it
it is doubtful that	possibly
it is evident that *a* produced *b*	a produced b
it is generally believed	many think
it is my understanding that	I understand that
it is of interest to note that	(leave out)
it is often the case that	often
it is suggested that	I think
it is worth pointing out in this context that	note that
it may be that	I think
it may, however, be noted that	but
it should be noted that	note that (or leave out)
it was observed in the course of the experiments that	we observed
join together	join
lacked the ability to	couldn't
large in size	large
let me make one thing perfectly clear	a snow job is coming
majority of	most
make reference to	refer to
militate against	prohibit
needless to say	(leave out, and consider leaving out whatever follows it)
new initiatives	initiatives
of great theoretical and practical importance	useful
of long standing	old
of the opinion that	think that
on a daily basis	daily
on account of	because
on behalf of	for
on no occasion	never
on the basis of	by
on the grounds that	since, because
on the part of	by, among, for
our attention has been called to the fact that	we belatedly discovered
owing to the fact that	since, because
perform	do

Jargon	*Preferred usage*
place a major emphasis on	stress
pooled together	pooled
presents a picture similar to	resembles
prior to	before
protein determinations were performed	proteins were determined
quantify	measure
quite a large quantity of	much
quite unique	unique
rather interesting	interesting
red in color	red
referred to as	called
relative to	about
resultant effect	result
serious crisis	crisis
smaller in size	smaller
so as to	to
subject matter	subject
subsequent to	after
sufficient	enough
take into consideration	consider
terminate	end
the great majority of	most
the opinion is advanced that	I think
the predominate number of	most
the question as to whether	whether
the reason is because	because
the vast majority of	most
there is reason to believe	I think
this result would seem to indicate	this result indicates
through the use of	fully
to the fullest possible extent	last
ultimate	agreement
unanimity of opinion	until
until such time	use
utilize	unique
very unique	believed
was of the opinion that	ways, means (not both)
ways and means	we don't know
we have insufficient knowledge	we thank
we wish to thank	why
what is the explanation of?	to
with a view to	about (or leave out)
with reference to	concerning, about (or leave out)
with regard to	about

Jargon	*Preferred Usage*
with respect to	about
with the possible exception of	except
with the result that	so that
within the realm of possibility	possible

Sermons on brevity and chastity are about equally effective. Verbal promiscuity flows from poverty of language and obesity of thought, and from an unseemly haste to reach print - a premature ejaculation, as it were. -Eli Chernin